

## TAD02 – A3 Practice (IR)

Name.....

1. Explain the following observation:  
Hydrogen iodide is infrared active whereas iodine is infrared inactive.

(Total 2 marks)

2. (a) Draw structures for **two** possible isomers of a compound with the formula  $C_2H_4O_2$ .

(2)

- (b) The infrared spectrum of this compound shows the following absorptions: 2920, 2765 and  $1710\text{ cm}^{-1}$ . Use the information in Table 18 of the Data Booklet to assign each absorption to a particular vibration.

2920  $\text{cm}^{-1}$  .....

.....

2765  $\text{cm}^{-1}$  .....

.....

1710  $\text{cm}^{-1}$  .....

.....

(2)

- (c) Deduce the structure from (a) which would demonstrate the infrared absorptions above. Explain your answer.

(2)

(Total 6 marks)

3. The infrared spectra of propanoic acid and methyl ethanoate contain absorptions in characteristic wavenumber ranges. Using Table 18 in the Data Booklet, identify:

- (a) **two** wavenumber ranges common to both compounds.

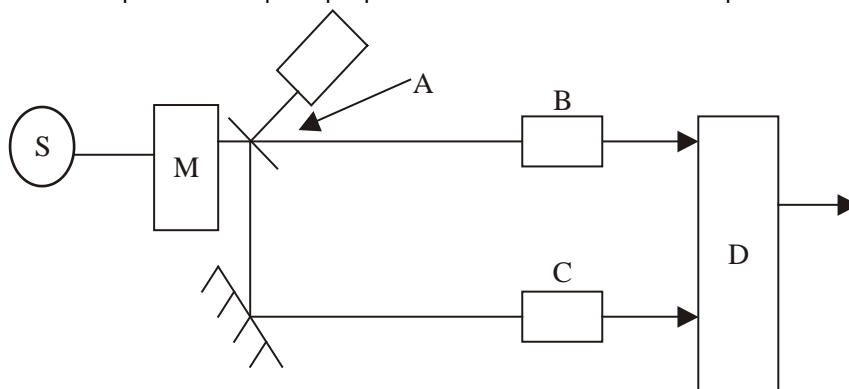
(1)

- (b) **one** wavenumber range found only in the spectrum of one compound.

(1)

(Total 2 marks)

4. (a) The diagram below represents the principal parts of a double beam infrared spectrometer.



- (i) Name the parts labeled A, B, and C.

A: .....

B: .....

C: .....

(2)

- (ii) Describe the function of the monochromator, M.

(1)

- (iii) Explain how the detector, D, works.

(2)

- (b) State and explain what happens to a molecule when it absorbs infrared radiation.

(2)

(Total 7 marks)